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SEQUENCE LISTING

<110> Bjorck, Lars
Rasmussen, Magnus

<120> STREPTOCOCCAL ALPHA ZM BINDING PROTEIN

<130> 100084.415US

<140> US 09/847,539

<141> 2001-05-01

<160> 30

<170> PatentIn Ver. 2.1

<210> 1

<211> 23

<212> PRT

<213> Streptococcus pyogenes

<400> 1

Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
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Leu Thr Asn Leu Leu Gly Asn
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<210> 2

<211> 58

<212> PRT

<213> Streptococcus pyogenes

<400> 2

Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
1 5 10 15

Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
20 25 30

Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
35 40 45

Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser
50 55

<210> 3

<211> 28

<212> PRT

<213> Streptococcus pyogenes

<400> 3

Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser
1 5 10 15

Glu Glu Ala Ala Val Val Lys Ala Asp Asn Ala Ala
 20 25

<210> 4
 <211> 184
 <212> PRT
 <213> Streptococcus pyogenes

<400> 4
 Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr
 1 5 10 15
 Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
 20 25 30
 Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
 35 40 45
 Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
 50 55 60
 Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
 65 70 75 80
 Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
 85 90 95
 Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
 100 105 110
 Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
 115 120 125
 Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg
 130 135 140
 Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro Phe
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 Phe Thr Ala Ala Ala Leu Ala Ile Met Val Ser Thr Gly Val Leu Val
 165 170 175
 Val Ser Ser Lys Cys Lys Glu Asn
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<210> 5
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 <212> PRT
 <213> Streptococcus pyogenes

<400> 5
 Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr

1 5 10 15
 Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
 20 25 30
 Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
 35 40 45
 Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
 50 55 60
 Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
 65 70 75 80
 Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
 85 90 95
 Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
 100 105 110
 Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
 115 120 125
 Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys
 130 135 140

<210> 6
 <211> 159
 <212> PRT
 <213> Streptococcus pyogenes

<400> 6
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 Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn
 20 25 30
 Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
 35 40 45
 Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala
 50 55 60
 Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
 65 70 75 80
 Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln
 85 90 95
 Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn
 100 105 110
 Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp
 115 120 125

Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg
130 135 140

Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro
145 150 155

<210> 7

<211> 217

<212> PRT

<213> Streptococcus pyogenes

<400> 7

Met Gly Lys Glu Ile Lys Val Lys Cys Phe Leu Arg Arg Ser Ala Phe
1 5 10 15

Gly Leu Val Ala Val Ser Ala Ser Val Leu Val Gly Ser Thr Val Ser
20 25 30

Ala Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly
35 40 45

Thr Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg
50 55 60

Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp
65 70 75 80

Lys Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu
85 90 95

Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val
100 105 110

Val Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp
115 120 125

Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp
130 135 140

Asn Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu
145 150 155 160

Asp Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu
165 170 175

Arg Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu Ser Asn Pro
180 185 190

Phe Phe Thr Ala Ala Ala Leu Ala Ile Met Val Ser Thr Gly Val Leu
195 200 205

Val Val Ser Ser Lys Cys Lys Glu Asn
210 215

B1

<210> 8
 <211> 259
 <212> PRT
 <213> Streptococcus pyogenes

<400> 8
 Ser Ala Phe Gly Leu Val Ala Val Ser Ala Ser Val Leu Val Gly Ser
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 Asn Gly Gly Thr Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu
 35 40 45
 Ala Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala
 50 55 60
 Ile Glu Asp Lys Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp
 65 70 75 80
 Ala Leu Glu Ala Leu Ala Asp Gln Ala Asp Ala Leu Gln Ser Glu Glu
 85 90 95
 Ala Ala Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala
 100 105 110
 Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val
 115 120 125
 Lys Ala Asp Asn Ala Ala Ser Asp Thr Leu Glu Ala Leu Ala Asp Gln
 130 135 140
 Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Lys Ala Asp Asn
 145 150 155 160
 Ala Ala Ser Asp Thr Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu
 165 170 175
 Gln Ser Glu Glu Ala Ala Val Val Lys Ala Asp Asn Ala Ala Ser Asp
 180 185 190
 Thr Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu
 195 200 205
 Ala Glu Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala Trp Gly Lys
 210 215 220
 Ala Ala Thr Pro Ile Ala Leu Asp Val Lys Lys Thr Lys Asp Thr Lys
 225 230 235 240
 Pro Val Val Lys Lys Glu Glu Arg Gln Asn Val Asn Thr Leu Pro Thr
 245 250 255
 Thr Gly Glu

<210> 9
 <211> 155
 <212> PRT
 <213> Streptococcus pyogenes

<400> 9
 Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu
 1 5 10 15
 Ile Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn Glu
 20 25 30
 Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys Glu
 35 40 45
 Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala Leu
 50 55 60
 Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Lys
 65 70 75 80
 Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr
 85 90 95
 Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn Ala
 100 105 110
 Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp Val
 115 120 125
 Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln
 130 135 140
 Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu
 145 150 155

<210> 10
 <211> 271
 <212> PRT
 <213> Streptococcus pyogenes

<400> 10
 Val Ser Ala Val Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn
 1 5 10 15
 Gly Gly Thr Leu Thr Asn Leu Leu Gly Asn Ala Pro Glu Lys Leu Ala
 20 25 30
 Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile
 35 40 45
 Glu Asp Lys Glu Ala Thr Thr Ala Ile Glu Ala Ala Ser Ser Asp Ala

50 55 60
 Leu Glu Ala Leu Ala Asp Gln Ala Asp Ala Leu Gln Ser Glu Glu Ala
 65 70 75 80
 Ala Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu
 85 90 95
 Ala Asp Gln Ala Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Gln
 100 105 110
 Ser Asp Asn Ala Ala Gly Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr
 115 120 125
 Asp Ala Leu Gln Ser Glu Glu Ala Ser Val Val Lys Ala Asp Asn Ala
 130 135 140
 Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln
 145 150 155 160
 Ser Glu Glu Ala Ser Val Val Lys Ala Asp Asn Ala Ala Ser Asp Ala
 165 170 175
 Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala
 180 185 190
 Ala Val Val Lys Ala Asp Asn Ala Ala Ser Asp Ala Leu Glu Ala Leu
 195 200 205
 Ala Asp Gln Thr Asp Ala Leu Gln Ser Glu Glu Ala Glu Val Val Gln
 210 215 220
 Ser Asp Asn Ala Ala Ser Asp Ala Trp Glu Lys Ala Ala Thr Pro Ile
 225 230 235 240
 Ala Leu Asp Val Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys
 245 250 255
 Glu Glu Arg Gln Asn Val Asn Thr Leu Pro Thr Thr Gly Glu Glu
 260 265 270

<210> 11
 <211> 167
 <212> PRT
 <213> Streptococcus pyogenes.

<400> 11
 Ala Ser Val Leu Val Gly Ser Thr Val Ser Ala Val Asp Ser Pro Ile
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 Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu Thr Asn Leu Leu
 20 25 30
 Gly Asn Ala Pro Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile

35 40 45
 Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys Glu Ala Thr Thr Ala
 50 55 60
 Ile Glu Ala Ala Ser Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr
 65 70 75 80
 Asp Ala Leu Gln Ser Glu Glu Ala Ala Val Val Lys Ala Asp Asn Ala
 85 90 95
 Ala Ser Asp Ala Leu Glu Ala Leu Ala Asp Gln Thr Asp Ala Leu Gln
 100 105 110
 Ser Glu Glu Ala Glu Val Val Gln Ser Asp Asn Ala Ala Ser Asp Ala
 115 120 125
 Trp Glu Lys Ala Ala Thr Pro Ile Ala Leu Asp Val Lys Lys Thr Lys
 130 135 140
 Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln Asn Val Asn Thr
 145 150 155 160
 Leu Pro Thr Thr Gly Glu Glu
 165

<210> 12
 <211> 654
 <212> DNA
 <213> Streptococcus pyogenes

<400> 12
 atgggaaaag aaataaaagt gaaatgcttt ttgcgtagat cagcttttgg attagttgcg 60
 gtgtcagcat cagtattagt cggttcaaca gtatctgctg ttgactcacc tatcgaacag 120
 cctcgaatta ttccaaatgg cggaacctta actaatcttc ttggcaatgc tccagaaaaa 180
 ctggcattac gtaatgaaga aagagccatt gatgaattaa aaaaacaagc tattgaggat 240
 aaagaagcta cgacagctat agaagcagca agttcagatg ccttagaagc attagcggat 300
 caaacagacg ctttacaatc agaagaagct gcggttggtta aagcggataa cgctgctagt 360
 gacgccttag aagcattggc ggatcaaaca gacgctttac aatcagaaga agctgaagta 420
 gttcaatcag ataacgctgc tagtgacgcc tgggaaaaag cagcaactcc aatcgcttta 480
 gatgttaaga aaactaaaga taaaaaacct gtagttaaaa aagaagaaag acaaaacggt 540
 aatacccttc ctacaactgg tgaagagtct aaccattctt ttacagctgc tgcgcttgca 600
 ataatggtaa gtacaggtgt gttagttgta agttcaaagt gcaaagaaaa ttag 654

<210> 13
 <211> 777
 <212> DNA
 <213> Streptococcus pyogenes

<400> 13
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 gttgactcac ctatcgaaca gcctcgaatt attccaaatg gcggaacctt aactaatctt 120
 cttggcaatg ctccagaaaa actggcatta cgtaatgaag aaagggccat tgatgaatta 180


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aaaaaacaag ctattgagga taaagaagct acgacagcta tagaagcagc aagttcagat 240
gccttagaag cattagcgga tcaagcagac gctttacaat cagaagaagc tgcagtagtt 300
caatcagata acgctgctag tgacgcctta gaagcattgg cggatcaaac agacgcttta 360
caatcagaag aagctgcggt tgtaaagcg gataacgctg ctagtgacac tttagaagca 420
ttggcggatc aaacagacgc tttacaatca gaagaagctg cggttgttaa agcggataac 480
gctgctagtg acactttaga agcattggcg gatcaaacag acgctttaca atcagaagaa 540
gctgcggttg ttaaagcgga taacgctgct agtgacactt tagaagcatt ggcgatcaa 600
acagacgctt tacaatcaga agaagctgaa gtagttcaat cagataacgc tgctagtac 660
gcctggggaa aagcagcaac tccaatcgct ttagatgtta agaaaactaa agatacaaaa 720
cctgtagtta aaaaagaaga aagacaaaac gttaataccc ttctacaac tggtgaa 777

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<210> 14

<211> 469

<212> DNA

<213> Streptococcus pyogenes

<400> 14

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gactcaccta tcgaacagcc tagaattatt ccaaattggcg gaaccttaat taatcttctt 60
ggcaatgctc cagaaaaact ggcattacgt aatgaagaaa gagccattga tgaattaaaa 120
aaacaagcta ttgaggataa ggaagctacg acagctatag aagcagcaag ttcagatgcc 180
ttagaagcat tagcggatca aacagacgct ttacaatcag aagaagctgc ggttggttaa 240
gcggataacg ctgctagtga cgccttagaa gcattggcgg atcaaacaga cgctttacaa 300
tcagaagaag ctgaagtagt tcaatcagat aacgctgcta gtgacgcctg ggaaaaagca 360
gcaactccaa tcgctttaga tgtaaagaaa actaaagata caaacctgt agttaaaaaa 420
gaagaaagac aaaacgttaa tacccttctt acaactggtg aagagtaac 469

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<210> 15

<211> 853

<212> DNA

<213> Streptococcus pyogenes

<400> 15

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gttgcggtgt cagcatcagt attagtcggt tcaacagtat ctgctgttga ctcacctatc 60
gaacagcctc gaattattcc aaatggcgga accttaacta atcttcttgg caatgctcca 120
gaaaaactgg cattacgtaa tgaagaaaga gccattgatg aattaaaaaa acaagctatt 180
gaggataaag aagctacgac agctatagaa gcagcaagtt cagatgcctt agaagcatta 240
gcggatcaag cagacgcttt acaatcagaa gaagctgcag tagttcaatc agataacgct 300
gctagtgacg ccttagaagc attagcggat caagcagacg ctttacaatc agaagaagct 360
gcagtagttc aatcagataa cgctgctggt gacgccttag aagcattggc ggatcaaaac 420
gacgctttac aatcagaaga agcttcgggt gttaaagcgg ataacgctgc tagtgacgcc 480
ttagaagcat tggcggatca aacagacgct ttacaatcag aagaagcttc ggttggttaa 540
gcggataacg ctgctagtga cgccttagaa gcattggcgg atcaaacaga cgctttacaa 600
tcagaagaag ctgcggttgt taaagcggat aacgctgcta gtgacgcctt agaagcattg 660
gcggatcaaa cagacgcttt acaatcagaa gaagctgaag tagttcaatc agataacgct 720
gctagtgcag cctgggaaaa agcagcaact ccaatcgctt tagatgttaa gaaaactaaa 780
gatacaaaac ctgtagttaa aaaagaagaa agacaaaacg ttaataccct tcctacaact 840
ggtgaagagt aac

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<210> 16

<211> 504

<212> DNA

<213> Streptococcus pyogenes

<400> 16

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gcatcagtat tagtgggttc aacagtatct gctgtggact cacctatcga acagcctcga 60
attattccaa atggcggaac cttactaat cttcttggca atgctccaga aaaactggca 120
ttacgtaatg aagaaagagc cattgatgaa ttaaaaaaac aagctattga ggataaagaa 180
gctacgacag ctatagaagc agcaagttca gatgccttag aagcattagc ggatcaaaca 240
gacgctttac aatcagaaga agctgcggtt gttaaagcgg ataacgctgc tagtgacgcc 300
ttagaagcat tggcggatca aacagacgct ttacaatcag aagaagctga agtagttcaa 360
tcagataacg ctgctagtga cgccctgggaa aaagcagcaa ctccaatcgc tttagatggt 420
aagaaaacta aagatacaaa acctgtagtt aaaaaagaag aaagacaaaa cgттаатacc 480
cttcctacaa ctggtgaaga gttaa 504

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<210> 17
<211> 24
<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence: primer

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<400> 17
agcttttggga ttagttgagg tgtc 24

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<210> 18
<211> 27
<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence: primer

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<400> 18
agcttttggga ttagttgagg tgtcagc 27

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<210> 19
<211> 25
<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence: primer

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<400> 19
ttgactcacc tatcgaacag cctcg 25

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<210> 20
<211> 32
<212> DNA
<213> Artificial Sequence

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<220>
<223> Description of Artificial Sequence: primer

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<400> 20
aaaacctgta gttaaaaaag aagaaagaca aa 32

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<210> 21
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: primer

<400> 21
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<210> 22
 <211> 19
 <212> PRT
 <213> Streptococcus pyogenes

<400> 22
 Asp Ser Pro Ile Glu Gln Pro Arg Ile Ile Pro Asn Gly Gly Thr Leu
 1 5 10 15
 Thr Asn Cys

B1
 <210> 23
 <211> 25
 <212> PRT
 <213> Streptococcus pyogenes

<400> 23
 Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys
 1 5 10 15
 Lys Gln Ala Ile Glu Asp Lys Glu Cys
 20 25

<210> 24
 <211> 19
 <212> PRT
 <213> Streptococcus pyogenes

<400> 24
 Glu Lys Leu Ala Leu Arg Asn Glu Glu Arg Ala Ile Asp Glu Leu Lys
 1 5 10 15
 Lys Gln Cys

<210> 25

<211> 18
 <212> PRT
 <213> Streptococcus pyogenes

<400> 25
 Glu Glu Arg Ala Ile Asp Glu Leu Lys Lys Gln Ala Ile Glu Asp Lys
 1 5 10 15
 Glu Cys

<210> 26
 <211> 20
 <212> PRT
 <213> Streptococcus pyogenes

<400> 26
 Lys Lys Thr Lys Asp Thr Lys Pro Val Val Lys Lys Glu Glu Arg Gln
 1 5 10 15
 Asn Val Asn Cys
 20

<210> 27
 <211> 764
 <212> DNA
 <213> Streptococcus pyogenes

<400> 27
 tttccaaatt atcggtaatt taatatgcta atgcatataa aaataaaaaa ggagaaacaa 60
 tgggaaaaga aataaaagtg aaatgctttt tgcgtagatc agcttttggg ttagttgcgg 120
 tgtcagcatc agtattagtc ggttcaacag tatctgctgt tgactcacct atcgaacagc 180
 ctcgaaattat tccaaatggc ggaaccttaa ctaatcttct tggcaatgct ccagaaaaac 240
 tggcattacg taatgaagaa agagccattg atgaattaaa aaaacaagct attgaggata 300
 aagaagctac gacagctata gaagcagcaa gttcagatgc cttagaagca ttagcggatc 360
 aaacagacgc tttacaatca gaagaagctg cggttgttaa agcggataac gctgctagt 420
 acgccttaga agcattggcg gatcaaacag acgctttaca atcagaagaa gctgaagtag 480
 ttcaatcaga taacgctgct agtgacgcct gggaaaaagc agcaactcca atcgctttag 540
 atgttaagaa aactaaagat acaaaacctg tagttaaaaa agaagaaaga caaaacgtta 600
 ataccttcc tacaactggg gaagagtcta acccattctt tacagctgct gcgcttgcaa 660
 taatggtaag tacaggtgtg ttagttgtaa gttcaaagtg caaagaaaat tagttgctat 720
 ttgttctagc aaatgaaaac agggaatcga aagattctct tttt 764

<210> 28
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 28
 gactcaccta tcgaacagcc tcg

<210> 29
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> PCR primer

<400> 29
 agcttcttct gattgttaaag cg

22

<210> 30
 <211> 20
 <212> PRT
 <213> Streptococcus pyogenes

<400> 30
 Gln Lys Gln Gln Gln Leu Glu Thr Glu Lys Gln Ile Ser Glu Ala Ser
 1 5 10 15
 Arg Lys Ser Cys
 20

Br
 Concludes